

F. Rapid Intervention Crew and Rescue Operations

General Background: RIC and Rescue

The Occupational Safety and Health Administration (OSHA) requires that a Rapid Intervention Crew (RIC) of at least two employees remain outside of an atmosphere that is considered immediately dangerous to life or health (IDLH) when a team consisting of a minimum of two members enters the IDLH atmosphere. This is defined in OSHA's Respiratory Protection standard 29 CFR 1910.134. The "Two-in/Two-out" team referred to in 29 CFR 1910.134 will be referred to as the Initial Rapid Intervention Crew (IRIC) throughout this chapter.

The Maryland Occupational Safety and Health's (MOSH) Maryland Fire Service Health and Safety Consensus Standard requires the Authority Having Jurisdiction (AHJ) to follow the standard set forth in 29 CFR 1910.134. In addition, the standard requires AHJ's to develop policies and procedures to ensure that a RIC is deployed at all incidents where an IDLH atmosphere is present. HCDFRS [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#) complies with the standards set forth by OSHA and MOSH. In addition, the 2018 National Fire Protection Association (NFPA) 1500 Standard on Fire Department Occupational Safety, Health, and Wellness Program, defines recommendations for fire and rescue services to adhere to during an emergency incident when a RIC crew is required. NFPA 1500, section 8.8 Rapid Intervention for Rescue of Members, outlines the recommendations set forth in this standard.

Policies and Standards Applicable to Howard County Department of Fire and Rescue Services: RIC and Rescue

Howard County Department of Fire and Rescue Services (HCDFRS) [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#) outlines the procedures for the deployment and rescue of operational personnel working in IDLH atmospheres. [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#) meets the expectations set forth in NFPA 1500, Standard on Fire Department Occupational Safety and Health Program Section 6-5 and 29 CFR 1910.134. HCDFRS reinforces the Two-in/Two-out crew with additional members as they become available. The reinforced IRIC team will be referred to as the RIC throughout this chapter.

HCDFRS [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#) requires an IRIC be implemented during the initial stages of any operation where crews will be operating in an IDLH atmosphere. The IRIC must be comprised of at least two qualified personnel who are positioned to observe the initial entry team entering the IDLH atmosphere. The personnel must be trained and equipped in full personal protective equipment (PPE), including self-contained breathing apparatus (SCBA). The IRIC must be available for immediate response to rescue the initial entry crew and ensure that at least one (1) member of the IRIC maintain contact with the initial entry crew visually, by voice, and/or by radio. Unless there is a known life hazard, no operation shall take place in the IDLH atmosphere until the IRIC is established. The IRIC function is typically assumed by the first arriving EMS transport unit, if qualified.

As personnel arrive and are available on the incident, the Incident Commander shall reinforce or replace the IRIC to establish a RIC. The RIC must consist of a minimum of four (4) qualified personnel. One of the members of the team, typically a company officer, shall be assigned as the RIC Supervisor. The RIC should remain available for the rescue of personnel operating in the IDLH atmosphere. Depending on the size and complexity of the incident, the Incident Commander should consider reinforcing the RIC with additional RIC's and/or special service companies (Aerial Apparatus or Squad Company).

HCDFRS [General Order 310.01 Single Family and Townhouse Structure Fire Operational Guidelines](#), states that the crew of the first arriving EMS transport unit shall report to the scene in full PPE and assume IRIC. If IRIC has not been established, it is the responsibility of the second arriving engine to assume the IRIC function. Unless otherwise advised it is the responsibility of the fourth arriving engine to augment IRIC and establish a RIC. The primary responsibility of the third arriving special service is to establish or support RIC. [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#) states that the Incident Commander may deviate from the default RIC assignment outlined in [General Order 310.01 Single Family and Townhouse Structure Fire Operational Guidelines](#) providing the function of IRIC and RIC are still assigned to other companies.

Woodscape Drive Incident Overview: Rapid Intervention Crew: RIC and Rescue On July 23, 2018, the Rapid Intervention Crew (RIC) was challenged with the difficult task of locating and attempting to rescue FF Nathan Flynn (Engine 101B) after he fell through a hole in the floor of a burning structure. Prior to the MAYDAY, the Incident Commander assigned Paramedic 56 to Initial Rapid Intervention Crew (IRIC). At 02:18:29, the Incident Commander assigned Truck 7 Rapid Intervention Crew (RIC). Immediately after FF Flynn fell through the hole, Engine 101A pulled on the hose line and Engine 51B reached into the hole in hopes of rescuing FF Flynn. Those efforts were unsuccessful.

After the MAYDAY transmission, the Incident Commander augmented the RIC with Engine 71 at 2:22:18. As the RIC was redeploying resources to the basement entrance, members of Truck 7 and Engine 71 sent members in both directions around the structure from Side A. They were able to determine FF Flynn's point of entry. This also allowed them to view all sides of the structure to ensure the basement entrance was the best option to begin the operation.

Engine 71A and Truck 7A were the first members of the RIC to enter the basement. They reported "cold smoke" conditions creating poor visibility for the members entering. Engine 71A took a few seconds to map the layout of the basement with the use of their Thermal Imaging Camera (TIC). A right-handed search was initiated by the members of the RIC. Engine 71B was on the nozzle of the 300-foot 1¾-inch hose line that was initially deployed from Engine 101 on Side A. Engine 71C was positioned on the hose line with Engine 71B. Truck 7B, Truck 7C, Truck 7A, and Paramedic 56D made entry to begin the search. Truck 7D initially remained on the exterior to prepare the RIC bag for additional air if needed.



Figure 21 RIT entry door to the right, first steps encountered by RIT, and furniture crews had to work around.

Crews first came across a set of steps that led to the first floor (Figure 21). Truck 7B ascended the steps and found high heat conditions and low visibility. The firefighter descended the steps and continued the search. As crews were moving forward into the basement they encountered furniture in their path (Figure 21), smoke conditions that were described as having a black-oily residue consistency, and a slippery floor potentially from the residue in the air. Truck 7C and Paramedic

56D located the second set of steps that led up to the crawlspace where FF Flynn was

located ([Figure 15](#)). They could hear the fire in the same direction. Truck 7C wiped his SCBA face-piece and could see a glow. They notified Engine 71B that the fire was in that direction and continued through the door and ascended the steps into the crawlspace where FF Flynn was located.

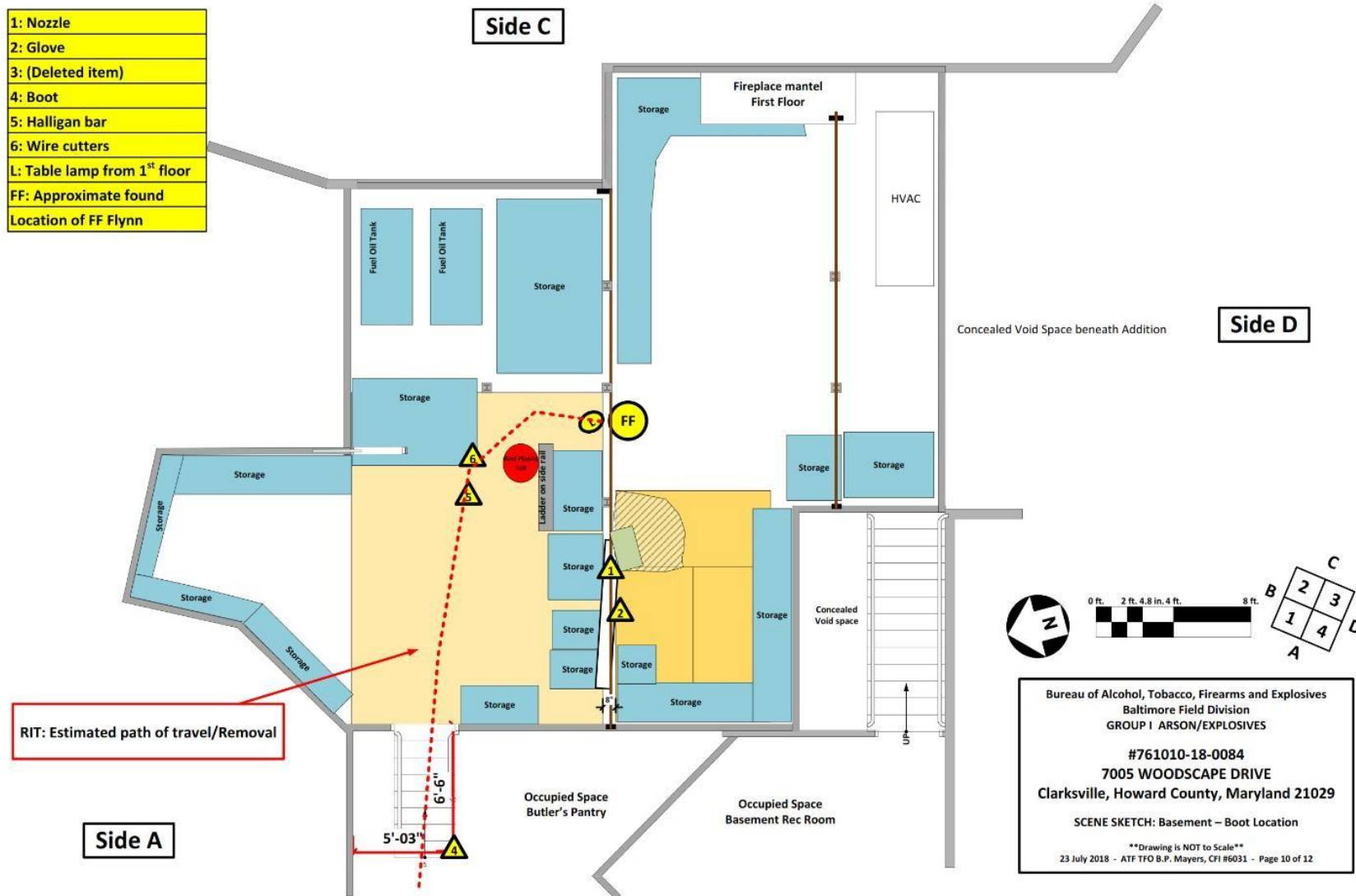


Figure 22 Diagram of RIC Path. Note, Side D on this diagram is incorrectly labeled. It is Side C for the purposes of this report.

Members of the RIC stated that as they got to the top of the steps, visibility was low, the heat had increased and they were able to hear FF Flynn's PASS Alarm. Fire was observed on both sides of the RIC. Engine 71A identified wires hanging from the ceiling level which were pushing against his chest. He removed his wire cutters and began to cut the wires to remove the hazard. At the same time, Truck 7A advised Engine 71B to extinguish the fire. Truck 7A had also become entangled in the wiring. Engine 71A felt Truck 7A's helmet hit his arm. It was determined that Engine 71B's nozzle opened accidentally while becoming entangled in the wiring knocking Truck 7A's helmet off. Engine 71A and Truck 7C assisted with freeing Truck 7A. Once Truck 7A was freed, Engine 71A advised Engine 71B to extinguish the fire. Engine 71B calmly stated to

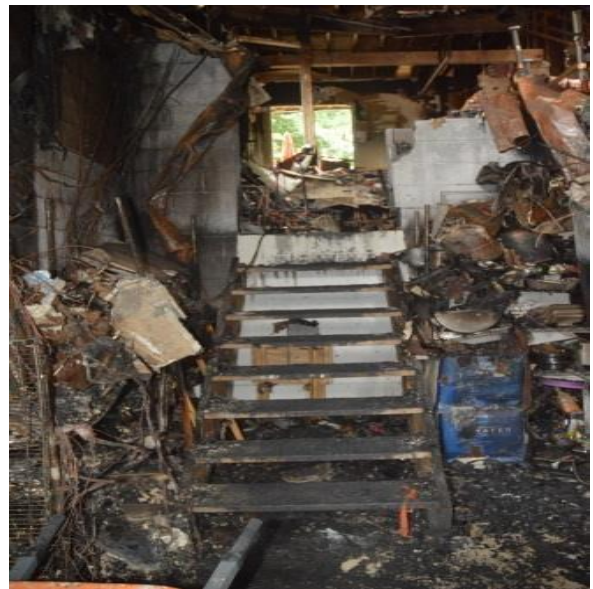


Figure 23 Steps leading from basement to crawl space where FF. Flynn was located

Engine 71A that the nozzle, and himself, were entangled and he was unable to open the nozzle. Engine 71A removed the entanglement from Engine 71B. Once freed, Engine 71B was able to extinguish the visible fire. It is believed that this is the first water placed on the fire during this incident.

Engine 71C advised Engine 71A that he was progressing forward toward the sound of the PASS



Figure 24 Crawlspace view from top of the steps. FF Flynn located just past folding ladder on other side of beam.

Alarm. As they moved forward, they remained low to the floor due to the amount of wires hanging. Engine 71C was the first member of the RIC to find FF Flynn (Figure 26) by following the sound of the activated PASS Alarm. He felt his hand come across FF Flynn's gear and felt around to see how he was positioned.

Engine 71C stated that when he found him, FF Flynn was very stiff, lying face down and slightly on his left side. They stated that there was no visible fire in that area, only smoke conditions. Engine 71C stated that

they felt what appeared to be a four-foot by four-foot hole in the wall and that FF Flynn may be stuck under something. The gauge on FF Flynn's SCBA showed that he still had a cylinder pressure above the red zone. Engine 71C removed his buddy-breathing line from the pouch on his SCBA, but decided not to remove FF Flynn's line and make the connection with air still remaining in FF Flynn's cylinder. As Engine 71C began to pull FF Flynn toward the steps (Figure 28), Engine 71A made it to their location to assist. Engine 71A believed they dragged FF Flynn approximately twenty-five (25) to thirty (30) feet to the steps. Truck 7C arrived at their location to assist with the removal of FF



Figure 28 - View from location where FF Flynn was located back toward steps from crawlspace to basement.

Flynn. Members of the RIC stated that when they saw FF Flynn his left glove was removed and his exposed hand was burned and stiff. FF Flynn's helmet began to fall forward during the removal process. While removing FF Flynn through smoldering debris, the members lost their footing and fell backwards toward the top of the steps.

At this point in the operation, members from Tower 10, Tower 3, and Engine 22 were inside the basement completing searches and standing by to provide additional assistance. Truck 7B removed FF Flynn down the steps to the main level of the basement. Members of the RIC noticed that some of their low-air alarms on their SCBA were activated at this point. As FF Flynn was removed from the basement crews had to move the furniture to make a straight path to the exterior. Other members in the basement assisted by removing FF Flynn the rest of the way to the exterior. FF Flynn was transferred to EMS personnel at the basement level for patient care and packaging.

Overall, Truck 7 was assigned RIC only one (1) minute and forty-two (42) seconds prior to the MAYDAY transmission from Engine 101A. The Incident Commander reassigned Engine 71 to work for Truck 7 as part of the RIC. Paramedic 56D, who was assigned as part of the Initial Rapid Intervention Crew (IRIC), also worked for Truck 7 as part of the RIC. In addition to the assigned RIC, Tower 3, Engine 22, Engine 61 and Tower 10 were assigned by Charlie Division to assist with rescue efforts. The RIC faced many challenges on that morning to include, but not limited to:

- Limited time to organize a sufficient tool cache
- Size of the structure
- Design and construction of the structure

- Limited personnel on scene at the time of the MAYDAY transmission
- Lack of accountability of all crew members immediately following the MAYDAY transmission
- Low visibility in the crawlspace
- Elevated temperature conditions inside the crawlspace
- Active fire conditions
- The potential of a floor collapse from above, in the area where FF Flynn was found and the RIC was operating
- Members of the RIC becoming entangled in electrical wiring
- Limited ability to communicate via portable radio to the exterior of the structure from areas within the basement.

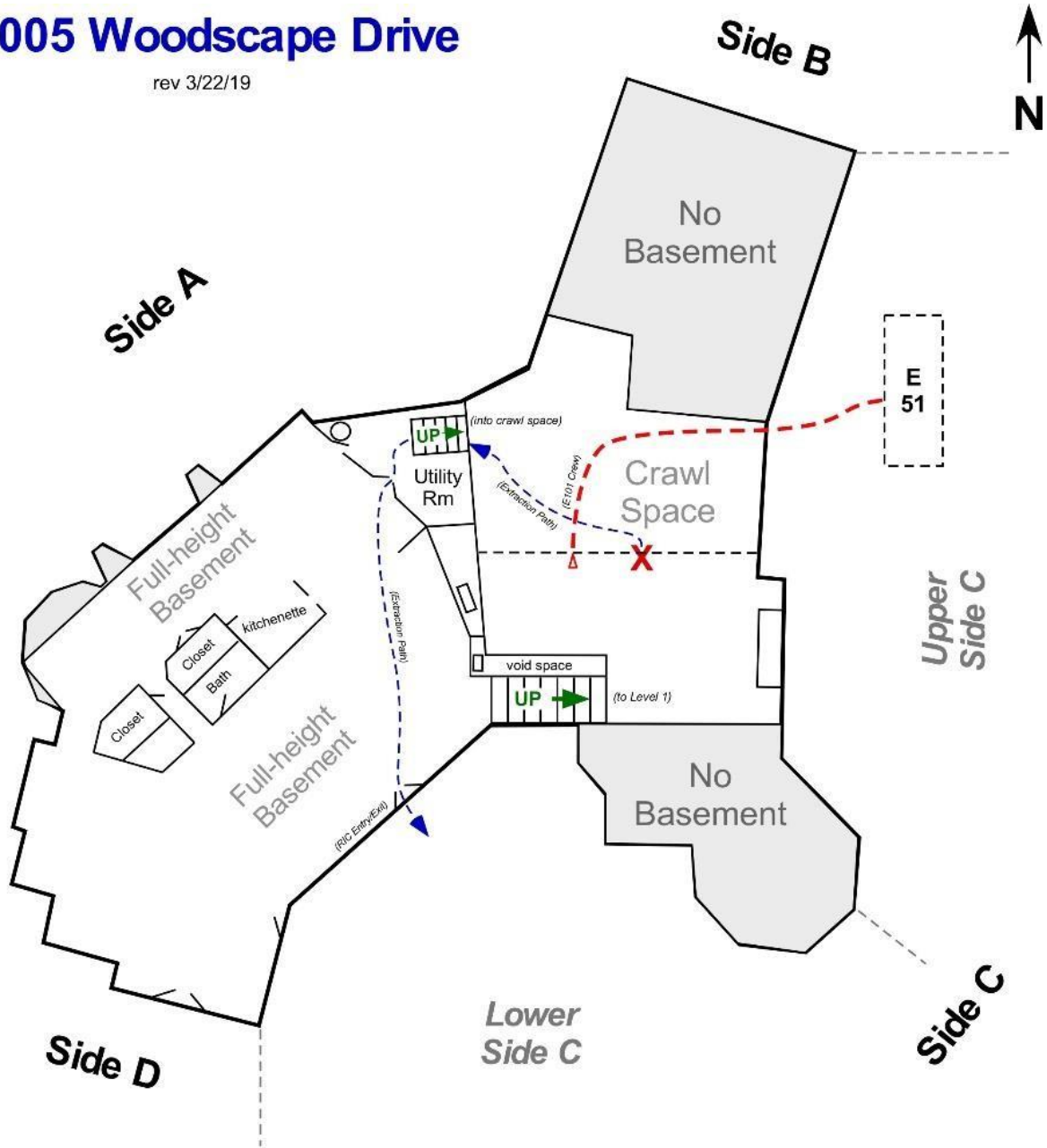


Figure 26 Conditions during RIC Operations from laundry room door (point of entry for FF Flynn).

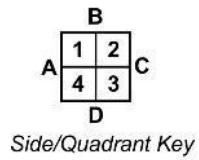
Despite the many challenges faced by the RIC, FF Flynn was removed in twenty-three (23) minutes and twenty-eight (28) seconds following the MAYDAY transmission, according to incident radio transmission records. This operation was successful due to the training, discipline, knowledge, and skill of the crews assigned to RIC.

7005 Woodscape Drive

rev 3/22/19



Basement Level



X = Victim Location

(drawing not to scale)

Findings and Recommendations: RIC and Rescue

In response to FF Flynn's MAYDAY call, the Rapid Intervention Crew (RIC) overcame numerous obstacles to reach their fallen comrade. These obstacles included the unusual design and size of the structure, limited personnel, low visibility, elevated temperature conditions, as well as RIC members becoming entangled and encumbered by electrical wiring in the structure. Despite the many challenges faced by the RIC, according to radio transmission records FF Flynn was removed in twenty-three (23) minutes and twenty-eight (28) seconds following the MAYDAY transmission.

Although the RIC performed admirably, the ISRB identified several actions personnel on the first floor near where FF Flynn had fallen could have taken in attempting to rescue FF Flynn. It is impossible to determine if any of these actions would have altered the outcome of FF Flynn's fatality, but for future incidents these potential actions must be considered. The ISRB is not suggesting that a company should operate above a fire, rather the ISRB is suggesting that these actions should have been considered by other crews in the same proximity of FF Flynn prior to their evacuation from the structure.

First, crews should have considered a method to apply water into the collapsed area where FF Flynn fell. FF Flynn's charged hose line was also through the hole and based on personnel accounts there was an attempt to pull FF Flynn back up using the hose. However, the crews were unable to move the hose line from the hole—making it impossible for crews to use that hose line to apply water to the fire. At the time, there was a second charged hose line behind the remaining crews in the laundry room which could have been retrieved by the crews to apply water to the fire in the crawlspace. Applying water to the fire at that time could have helped control the conditions in the space.

Second, crews should have used their Thermal Imaging Cameras (TIC) to locate FF Flynn and identify associated conditions in the crawlspace. Although Engine 101A had a TIC on their person when FF Flynn fell into the space, there were no indications of crews scanning the hole prior to Engine 101A and Engine 51A evacuating the space. Had it been possible to scan the area, crews may have located FF Flynn, contextualized the conditions in the space, and identified any special resources that may have been needed to extricate FF Flynn.

Third, crews in close proximity to the space in which a MAYDAY firefighter has fallen should attempt a rescue from above. In this particular incident, crews close to the hole FF Flynn fell into did not believe that it was possible to rescue FF Flynn from above. Rather, they believed a rescue from below was the best course of action. The ISRB is not questioning this assessment by crews faced with the strenuous conditions they encountered. However, the ISRB review notes the general lack of training available to HCDFRS members on how to effectuate a rescue from above in realistic conditions. Without even the opportunity for such a training, crews remain unable to conduct MAYDAY rescues from above.

Fourth, the Initial Rapid Intervention Crew (IRIC) was not established near the point of entry of crews operating in an IDLH environment and were not operating as a team during this incident. Under [General Order 310.01 Single Family and Townhouse Structure Fire Operational Guidelines](#), IRIC responsibility fell to Paramedic 56 based on arrival order. Upon arrival, Paramedic 56's crew dressed out in PPE and reported to the scene. On the scene, Paramedic 56A and Paramedic 56D split up. Paramedic 56D began IRIC functions (deploying ground ladders and forcing and controlling doors as a means of egress for interior crews) and met up with the RIC once it was established. Paramedic 56A reported to Engine 51D to assist with establishing a water supply from the pool.

Paramedic 56A was in a separate location from Paramedic 56D and was not part of the RIC or IRIC functions for FF Flynn. Based on statements from individuals on the fireground, Paramedic 56A assisted in establishing water supply based on a standing practice for Station 5 A-shift. Paramedic 56A continued to assist Engine 51D in establishing a water supply as RIC operations were being conducted. Once the water supply was established, Paramedic 56A reported to assist with patient care of FF Flynn as he was removed from the structure.

Throughout the incident, the Incident Commander was unaware that Paramedic 56 separated, assuming that Paramedic 56 was operating as a team of two and fulfilling IRIC functions. At 02:12:01, Incident Command asked Paramedic 56 to confirm their location. Paramedic 56D confirmed IRIC on Side A. At no point during the incident did the crew from Paramedic 56 operate as a team while performing IRIC functions. For future incidents, crews designated as the IRIC should remain operating as a unit until they are assigned to another function by the Incident Commander.

Fifth, Engine 111 was the fourth arriving engine company on location and should have established the RIC based on [General Order 310.01 Single Family and Townhouse Structure Fire Operational Guidelines](#), however Engine 111 first reported to a secondary water supply location to assist Engine 71. This decision was confirmed by the Incident Commander and the Incident Commander did not provide Engine 111 another assignment until FF Flynn was removed from the structure. Engine 111 not reporting to the scene after securing Engine 71's water supply limited the tactical options available to the Incident Commander.

Sixth, Truck 7 was assigned RIC duties at 02:18:19 by the Incident Commander. At that time, RIC was positioned at the entrance to the first floor on Side A. One (1) minute and forty-two (42) seconds later (02:20:11) the MAYDAY was declared. This did not afford Truck 7 enough time to complete a 360-degree survey of the building, a risk assessment, rescue plan, and the time to gather the proper cache of RIC equipment. With the extreme time constraint, Truck 7 was not able to meet with the Incident Commander to confer about the operational plan and location of all companies within the structure. Additionally, the location and extent of the fire had not been determined by companies operating on the fireground.

Seventh, Engine 71 and Paramedic 56D were assigned to assist Truck 7 as part of the RIC. Engine 71 and Paramedic 56D were positioned on Side A of the structure at the front door with Truck 7

when the MAYDAY was declared. Engine 71 was manning a 300-foot 1¾-inch charged hose line from Engine 101's apparatus. Following the MAYDAY transmission, Engine 71 was reassigned by the Incident Commander to work for Truck 7 as part of RIC. Paramedic 56D that was performing the IRIC functions also joined RIC per [General Order 300.11 Rapid Intervention and IDLH Initial Entry Teams](#). The Incident Commander did not verbally assign Paramedic 56 to RIC, however, later radio transmissions show that the Incident Commander was under the impression that Paramedic 56 was working with the RIC.

Engine 71 redeployed the 300-foot 1¾-inch charged hose line around Side D to the Side C basement entrance. While this was being completed, Truck 7A repositioned around Side B to the Side C basement entrance. This allowed members of the RIC to collectively see all sides of the structure. The RIC assembled at the entrance to the basement on Side C and eventually made entry from this point to conduct the RIC operation. At 02:30:12 hours, the Incident Commander notified the Side C Division Supervisor that he was sending Tower 3 to assist Truck 7 and Engine 71. At this point in the operation, the RIC was inside the structure attempting to locate FF Flynn.

Eighth, crews working on the first floor of the structure during the MAYDAY immediately attempted to rescue FF Flynn. After FF Flynn fell through the hole in the floor, Engine 51B reached into the hole in an attempt to help FF Flynn out, but was unable to locate FF Flynn. Engine 51B advised Engine 101A that the fire was below them, with heat coming through the hole. He also advised that they needed help and were unable to reach FF Flynn from that location. Engine 51A located and removed Engine 101A from the immediate area. Engine 51B exited the structure with them.

While Engine 101A, Engine 51A, and Engine 51B were exiting, Tower 10A and Tower 10B identified two hose lines leading into the laundry room on Floor 1. The first hose line was the one FF Flynn had been operating and the second was the one deployed by Engine 51's crew. To avoid confusion during RIC operations, Tower 10A instructed Tower 10B to remove the line deployed by Engine 51. Tower 10B removed the line, leaving only the hose line FF Flynn had operated. Tower 10A and Tower 10B exited the structure once they heard that Engine 101A was out of the building and FF Flynn was in the basement.

Ninth, RIC operations were successfully completed using the basement entrance on the lower Side C. The RIC was comprised of Truck 7, Engine 71, and Paramedic 56D. Tower 3, Engine 22, Engine 61 and Tower 10 assisted in RIC operations, making entry from the same location. Many challenges were presented to the RIC during the operation. The RIC Supervisor was unable to transmit radio communications from the area where FF Flynn was found. Members of the RIC operated in low-visibility conditions with elevated temperatures and active fire in the space. Multiple RIC members and the nozzle of the hose line became entangled in wiring that was hanging in the space. The members of the RIC and members that assisted with the operation overcame all of the obstacles presented to them. While FF Flynn did not survive his injuries, the actions and bravery of the crews allowed the safe recovery of FF Flynn from the structure.

Lastly, the Incident Commander assigned additional RIC crew resources as soon as more units arrived at the incident scene. A second RIC, referred to as "RIC Number Two," was assigned to the basement entrance on Side C. This second RIC team included Engine 61, Engine 91, and Engine 22. Prior to being assigned to RIC Number Two, Charlie Division assigned Engine 22 to assist the RIC inside the basement. Engine 61A was assigned as the second RIC Supervisor. Although RIC Number Two was never officially deployed, members assisted with the removal of FF Flynn from the basement level.

| Findings | Recommendations |
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| F.1. Crews near the collapsed area where FF Flynn fell should have considered a method to apply water to the area | <p>F.1.1. Train crews who may be operating near a MAYDAY to respond to the MAYDAY situation while continuing to address suppression activities.</p> <p>F.1.2. HCDFRS must develop a progressive training plan that develops and reinforces basic skills. This training plan must include:</p> <ul style="list-style-type: none"> • RIC training at least bi-annually, focusing on low frequency, high stress situations for operations and communication staffing. • Instruction for personnel on actions to be taken from different positions within the structure. For example, personnel shall be instructed on proper search techniques when searching for a downed firefighter, rescue from the floor above, stabilizing conditions, and providing protection to the MAYDAY firefighter. • Officer training on managing a MAYDAY emergency. This training can take place simultaneously with the RIC training previously discussed. |
| F.2. Crews should have used their Thermal Imaging Cameras (TIC) to locate FF Flynn and identify associated conditions in the crawlspace. | F.2.1 Crews should receive training on TIC usage and TIC limitations, and they should regularly use the TIC on various types of incidents to gain familiarity with the devices. |

| Findings | Recommendations |
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| F.3. Crews near the space in which a MAYDAY firefighter has fallen should attempt a rescue from above | See Recommendation F.1.1 |
| F.4. The IRIC did not function as a team, with the two members in separate physical locations completing separate tasks. | <p>F.4.1. The Incident Commander should ensure that IRIC remains ready for deployment as a team of two. The IRIC shall be positioned at the initial point of entry for rapid deployment.</p> <p>F.4.2. Train IRIC personnel to remain a team of two. Personnel must understand the difference between functioning as a back-up crew and IRIC.</p> |
| F.5. Engine 111's failure to assume RIC as dictated in General Order 310.01 did not impact RIC operations during the incident because the Incident Commander assigned RIC duties to Truck 7 prior to the MAYDAY. | <p>F.5.1 Notwithstanding the lack of impact, HCDFRS must revise General Orders to instruct the Communications Center to advise the third arriving engine that they are the RIC. (See F.6.1).</p> <p>F.5.2 The highest-ranking responding officer, typically the responding Battalion Chief, should confirm with the third engine company that they will be the RIC engine. The RIC engine should acknowledge the assignment shortly after units transmit they are responding.</p> <p>F.5.3 Shift directives that may alter assignments must be communicated to the Incident Commander.</p> |
| F.6. Truck 7 lacked enough time because of their delayed assignment to RIC and the subsequent immediate MAYDAY to gather all standard RIC equipment and do a 360-degree assessment of the dwelling. | F.6.1 HCDFRS must add an additional engine company to all Box Alarms, including Local Box assignments, with the third due engine (minimum 4 personnel) dedicated as the RIC. |
| F.7. The RIC at Woodscape Drive consisted of Truck 7, Engine 71, and Paramedic 56D. Engine 71 supplemented Truck 7 in completing the 360-degree assessment of the dwelling. | F.7.1 The IC must articulate the companies that form a RIC at an incident, including single resources like Paramedic 56D at this incident. |
| F.8. Crews working on the first floor of the structure during the MAYDAY immediately attempted to rescue FF | F.8.1 An additional Safety Officer should be assigned to RIC operations with responsibility of the safety of the RIC. The Safety Officer should monitor incident |

| Findings | Recommendations |
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| Flynn but determine that rescue should be made via the basement. | conditions and operational periods to assist with managing air supply. If necessary, the Safety Officer should request additional resources to ensure the RIC operation may continue with minimal interruption. |
| F.9. The RIC members and members that assisted with the operation overcame all obstacles presented to them. Although FF Flynn did not survive, the actions and bravery of the crews allowed the safe recovery of him from the structure. | No recommendation |
| F.10. For large structures with multiple points of entry, a second RIC is needed to ensure quick response time to any potential MAYDAY emergency. | <p>F.10.1 ICs should consider assigning additional RICs when multiple points of entry are used. The size of the structure should identify the need for additional RIC's and/or enlarging the RIC to ensure adequate personnel are assigned if an emergency occurs.</p> <p>F.10.2 HCDFRS must develop a General Order that Addresses tiered RIC structures based on the complexity of an incident (e.g., adding additional engine(s), special services, or a collapse team with a Level II RIC structure).</p> |